

# Determinants of Loneliness among Older Adults in Canada

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## RÉSUMÉ

L'objectif de cette étude était de découvrir les déterminants principaux de la solitude des Canadiens âgés. Nous avons tiré sur des hypothèses concernant l'importance de la concordance entre la personne et l'environnement pour tester l'importance relative des caractéristiques personnelles, des conditions de vie privées, du réseau social/engagement social, et de la plausibilité de l'explication de la solitude. Les données comprenaient un échantillon de 3 799 répondants âgés de plus de 65, tirées de l'Enquête sociale générale de Statistique Canada, Cycle 22. Les caractéristiques personnelles, la dimension et la composition des réseaux sociaux, et la satisfaction avec les contacts du réseau, tous sont révélés d'être liés à la solitude, de même que les indicateurs de vivre sous des conditions économiquement et socialement difficiles. Les personnes âgées qui ont connu un recul récente de leurs situations financières, et qui n'avaient pas l'aide nécessaire pour faire face à un défi personnel récente, ont déclaré des niveaux plus élevés de la solitude. Une caractéristique frappante de nos résultats, cependant, c'est les scores relativement faibles sur la solitude des Canadiens âgés par rapport aux personnes âgées dans d'autres pays.

## ABSTRACT

The purpose of this study was to determine the key determinants of loneliness of older Canadians. We drew on the assumptions concerning the importance of *person-environment fit* to test the relative importance of personal characteristics, deprived living conditions, social network/social engagement, and satisfaction in explaining loneliness. Data comprised a sample of 3,799 respondents over age 65 drawn from Statistics Canada's General Social Survey, Cycle 22. Personal characteristics, social network size and composition, and satisfaction with network contact were found to be related to loneliness, as were indicators of living in economically and socially challenging conditions. Older adults who had experienced a recent downturn in their financial situation, and who lacked the help needed to cope with a recent personal challenge, reported higher levels of loneliness. A striking feature of our findings is the relatively low scores on loneliness of older Canadians compared to older adults in other countries.

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A varied social network of kin and non-kin relationships and optimal exchanges of support within the network have been shown to be important determinants of feeling socially embedded and consequently of general well-being in later life (Hawkey et al., 2008).

Conceptualizations of loneliness have long addressed this relationship. More than 30 years ago, Perlman and Peplau (1981, p. 31) defined loneliness as "the unpleasant experience that occurs when a person's network of social relations is deficient in some important way

quantitatively or qualitatively". De Jong Gierveld (1987) posited a similar definition, frequently used in European countries, which states:

loneliness is a situation experienced by the individual as one where there is an unpleasant or inadmissible lack (quantity or quality) of certain relationships. This includes situations in which the number of existing relationships is smaller than is considered desirable or acceptable, as well as situations where the intimacy one wishes for has not been realized. (p. 120)

Central to both definitions are the assumptions that loneliness is a subjective and negative experience, and that it is the outcome of a cognitive evaluation of the match between the quantity and quality of existing relationships and individuals' expectations regarding them.

Over the years, much has been learned about the links between social networks and loneliness. Important determinants have been identified, and researchers have constructed and tested conceptual loneliness models that integrate socio-demographic characteristics, factors regarding the size and composition of the social network, and the evaluation of social relationships to explain the intensity of loneliness (De Jong Gierveld, 1987; Hawkey et al., 2008). In this article, we describe our study that built on this foundational work by further theorizing relevant determinants of loneliness, and exploring empirically the relative importance of determinants of loneliness in the Canadian context.

Given that there is only a small body of research on loneliness of the older population in Canada (Havens & Hall, 2001; Van Tilburg, Havens, & De Jong Gierveld, 2004; Wu & Penning, 2015), and given the established importance of loneliness to well-being in later life, it is important to deepen our understanding of the factors associated with loneliness in Canada. We have built on previous research by including several previously identified explanatory factors associated with loneliness but address, in addition, deprived living conditions of older adults as indicators of environmental press that may influence the depth of loneliness of older Canadians.

## Conceptual Background

Loneliness is most often conceptualized as one of the possible outcomes of the subjective evaluation of the number of kin and non-kin relationships in one's personal network, of the support exchanges within this network, and of individual expectations regarding the network. Social isolation and loneliness are conceptually distinct (Hortulanus, Machielse, & Meeuwesen, 2006). An individual who is well positioned in terms of objective social participation can occupy virtually any

position on the subjective continuum, depending on his or her relationship expectations or wishes.

Acknowledging the importance of the concept of these "relationship standards", Perlman and Peplau (1981) developed a cognitive discrepancy approach to loneliness that focuses on the subjective evaluation of relationships in association with personal standards for what constitutes an optimal network of social relationships. The assumption is that the size and other characteristics of an older person's network of relationships are, to a certain extent, a matter of personal choice, related to personal standards or wishes of the person. Thus, some older adults are committed to maintaining close contacts with kin or with neighbours and friends while others avoid frequent encounters.

Gerontologists might argue that such a strong emphasis on the importance of personal preferences and agency masks constraints that may accompany later life. Wahl, Iwarsson, and Oswald (2012, p. 306) made this point when they stated that while there is broad consensus that both personal and environmental resources contribute to aging well, their contributions have been largely overlooked. Following this argument, personal characteristics such as age, sex, marital status, and health – often included as control variables in loneliness models – can be more explicitly conceptualized as resources that create opportunities and constraints that influence the risk of loneliness.

Environmental press, first described by Lawton & Nahemow (1973), also is relevant in understanding a negative outcome such as loneliness. Victor, Scambler, Bond, and Bowling (2000) found that some older adults are confronted with environmental challenges such as deprived living conditions, a shortage of social network members, and low quality of interactions with others, and that these factors place them at risk of loneliness (Victor et al., 2000). De Jong Gierveld and Tesch-Römer (2012) have concurred, providing evidence linking poor living conditions to loneliness. In our current study, we added living conditions, as an example of environmental resources, to the social resources that have long formed a core element of theoretical thinking about loneliness conceptualization.

Thus, in designing this study, we built on theoretical ideas about loneliness as formulated by De Jong Gierveld, Van Tilburg, and Dykstra (2006) and related loneliness models (De Jong Gierveld, 1987; De Jong Gierveld & Tesch-Römer, 2012; Hawkey et al., 2008). We drew on the assumption from environmental gerontology that older adults "are particularly sensitive to the nature and character of P-E interactions" (Wahl et al, 2012, p. 307), thus making explicit personal resources and environmental and social demands that might influence loneliness. Satisfaction, a core element of

existing loneliness models, is viewed as the individual's assessment of the fit between their resources and environmental demands. Based on this set of assumptions, we hypothesized elements of a loneliness model with four blocks of determinants of loneliness: (a) personal characteristics, (b) deprived living conditions, (c) social network/social engagement, and (d) satisfaction.

### Personal Characteristics

Older adults face an elevated risk of loneliness as they age (Penning, Liu, & Chou, 2014) in part because of reduced personal resources related to marital status and health. Widowhood and divorce, increasingly likely with age, are risk factors for loneliness (Allen, Blieszner, & Roberto, 2000; Dykstra & De Jong Gierveld, 2004), whereas marriage is known to offer a great degree of protection against loneliness (De Jong Gierveld, Broese van Groenou, Hoogendoorn, & Smit, 2009; Waite & Lehrer, 2003). Older adults who are no longer married or never married, and who do not share a household with a partner, frequently have to rely on people outside the household for support and help. Maintaining contact with network members living elsewhere requires more time, initiative, and perseverance, although contemporary modes of communication and travel have facilitated contact among network members who do not live close to each other (Ajrouch, Akiyama, & Antonucci, 2007). Widowhood is more frequently a woman's than a man's experience. Aartsen and Jylhä (2011) showed that the higher incidence of loneliness among women could be explained in part by the unequal distribution of the risk of becoming widowed among men and women. In a review of more than 300 studies on gender differences in subjective well-being including loneliness, Pinqart and Sorensen (2001a) found that older women had significantly lower well-being than men did. Based on these findings, we formulated **hypothesis 1**: being older, being unmarried, and being female are associated with higher levels of loneliness.

Studies have shown repeatedly that older adults who are in poor health are prone to high levels of loneliness (De Jong Gierveld et al., 2006; Korporaal, Broese van Groenou, & Van Tilburg, 2008; Pinqart & Sorensen, 2001b; Victor et al., 2000). In addition to physical health problems, experiencing mental health problems also affects levels of loneliness (Kuyper & Fokkema, 2010; Warner & Kelley-Moore, 2012). Cacioppo, Hughes, Waite, Hawkley & Thisted (2006) showed that loneliness and depressive symptoms could act synergistically to diminish well-being in older adults. That said, one has to keep in mind that the health–loneliness relationship is likely reciprocal: poor health might affect loneliness, and loneliness affects the health conditions of persons (Havens & Hall, 2001; Lauder, Mummery,

Jones, & Caperchione, 2006). Based on these findings, we formulated **hypothesis 2**: poor health is associated with higher levels of loneliness.

### Deprived Living Conditions

There is growing evidence of the links between deprived living conditions and loneliness. Socioeconomic status influences older persons' ability to optimize and diversify social contacts during the life course, affecting loneliness in late adulthood (Ajrouch, Blandon, & Antonucci, 2005; Fokkema, De Jong Gierveld, & Dykstra, 2012; Savikko, Routasalo, Tilvis, Strandberg, & Pitkala, 2005). For example, Broese van Groenou and van Tilburg (2003) found that education level is associated with access to resources among older people. Persons with lower levels of education are less likely to be employed and, if employed, more likely to be employed in low-pay, no-benefit jobs. They also have lower levels of financial capability which in turn will affect negatively their economic security, well-being, and prosperity (Arrowsmith & Pignal, 2010).

Loneliness may be particularly affected by late-life changes in resources that result in having insufficient means to make ends meet, and that go beyond one's capacities to manage alone (De Jong Gierveld et al., 2006). Research in rural Canada found evidence of loneliness among longtime residents of newly affluent communities who were no longer able to take part in activities and organizations and for whom constrained financial circumstances led to truncated social connections (Keating, Eales, & Phillips, 2013). Such situations may become more commonplace given rising income inequality in Canada, widening gaps in home ownership, and heightened risk of poverty among older people (Statistics Canada, 2011). These changes in living environments led us to formulate **hypothesis 3**: low educational achievement, lack of home ownership, decreased financial resources, and unmet needs are related with higher levels of loneliness.

### Social Network/Social Engagement

A core set of factors related to loneliness are the personal network of kin and non-kin relationships, and a person's involvement in community organizations. Research has shown that the size, composition, and support exchanges within the social network are strongly associated with levels of loneliness among older adults (Pinqart, 2003). Hagestad (1987) described the socially integrative role of families, arguing that communication and historical conversations across generations help maintain continuity across life phases and strengthen one's sense of belonging. Adult children are an important source of companionship, closeness,

and sharing, particularly for those who live alone (Dykstra, 1993; Pinquart, 2003). Based on these findings, we formulated **hypothesis 4**: frequency of contact with relatives, and especially the identification of relatives as close or intimate family members, are associated with lower levels of loneliness.

The importance of non-kin, including friends and neighbours, for alleviating loneliness also is well documented (Blieszner & Adams, 1992; Cacioppo & Patrick, 2009). The joy of spending time together, the compassion evident in keeping up with personal ups and downs, and the exchange of ideas are main mechanisms in this process (Victor et al., 2000). Close friends can step in and function as confidants and in doing so help alleviate loneliness, in particular for never-partnered or childless adults (Dykstra, 1993; Pinquart, 2003). Thus, we formulated **hypothesis 5**: the frequency of contacts with friends and other non-kin, and especially the identification of friends as close, are negatively associated with loneliness.

Involvement in organizations, including church and community organizations, bring people together and is a means of forming new friendships and acquaintances (Fast & De Jong Gierveld, 2008; Fraser, Clayton, Sickler, & Taylor, 2009; Rozanova, Dosman, & De Jong Gierveld, 2008; Väänänen, Buunk, Kivimäki, Pentti, & Vahtera, 2005). Moreover, researchers have found that as mutual concern for the other's well-being and shared feelings of community embeddedness increase, the risk of loneliness decreases (Thomése, Van Tilburg, & Knipscheer, 2003; Brown, Consedine, & Magai, 2005). In this context, we formulated **hypothesis 6**: participation in community organizations is negatively related to loneliness.

## Evaluations/Satisfaction

Perceived quality of the social network has been shown to be more important in explaining loneliness than the size of the social network per se (Victor et al., 2000). Routasalo, Savikko, Tilvis, Strandberg, and Pitkala (2006) showed that dissatisfaction with contacts with children or friends was a more powerful predictor of loneliness than the actual frequency of contacts with children and friends. Hawkey et al. (2008) further showed that being satisfied with network relationships had an additional protective effect independent of network size. Thus, we developed **hypothesis 7**: satisfaction with communication with relatives and with friends will be negatively related to loneliness.

Finally, we hypothesized that perceived balance of personal resources and constraints can influence loneliness. Edwards, Cable, Williamson, Lambert, and Shipp (2006) have suggested that there is much to be learned about how people combine beliefs about themselves

and their environment into a sense of fit between the demands of the environment and personal resources. Life satisfaction might be considered a proxy for "demands-abilities fit" (p. 804). Thus, we proposed **hypothesis 8**: life satisfaction is negatively related to loneliness.

## Methods

### Data

Data were drawn from the public-use microdata file of Statistics Canada's General Social Survey, Cycle 22 (GSS-22), Social Networks. The GSS sample was selected using random-digit dialing, and data were collected via computer-assisted telephone interviewing. Interviews with 20,401 Canadian men and women aged 15 or older (excluding full-time residents of institutions and residents of the northern territories) took place from February through November 2008. The response rate was 57.3 per cent. Content relevant to the current study included information on respondents' living arrangements, contact with friends and relatives, civic participation, well-being (including loneliness), and demographic and socioeconomic background characteristics.

For purposes of this study of the determinants of loneliness among Canadian older adults, we selected 3,799 respondents aged 65 and older who had provided information to the interviewers on loneliness.

### Operational Measures

GSS-22 included the short form of the De Jong Gierveld Loneliness Scale which we used as the dependent variable in the current study. The scale comprises 6 items, 3 of which are indicators of emotional loneliness and 3 are indicators of social loneliness (De Jong Gierveld & Kamphuis, 1985; De Jong Gierveld & Van Tilburg, 1999, 2006, 2010). Total scores on the loneliness scale range from 0 (not lonely) to 6 (extremely lonely). The scale has been used extensively and found to be reliable and valid as a unidimensional measure of loneliness among older adults. (Dykstra & Fokkema, 2007; Grygiel, Humenny, Rebisz, Świtaj, & Sikorska, 2013; Leung, De Jong Gierveld, & Lam, 2008; Penning et al., 2014; Pinquart & Sörensen, 2001b).

Independent variables included personal characteristics (sex, age, health, and marital status), deprived living conditions (low level of educational attainment, lack of home ownership, diminished financial condition, and unmet needs), social network characteristics (number and contact with relatives, close relatives, friends and close friends, religious attendance, membership in community organizations), and evaluation of network quality (satisfaction with

frequency of communication with relatives and friends, life satisfaction).

#### *Personal Characteristics*

Sex is a dichotomous variable (0 = male; 1 = female) whereas age is entered as a continuous variable. Health indicators included self-reported health and mental health. Both are operationalized as dichotomous variables (0 = fair or poor; 1 = excellent, very good, or good). Marital status is operationalized as a set of dummy variables: married or common law (0 = no; 1 = yes; the reference category in multivariate analyses); widowed (0 = no; 1 = yes); divorced or separated (0 = no; 1 = yes); never married (0 = no; 1 = yes).

#### *Deprived Living Conditions*

For purposes of this study, we operationalized education in the multivariate analysis as a dichotomous variable (0 = high school completion or more; 1 = less than high school completion). Home ownership was used as a proxy measure of respondents' wealth (0 = yes; 1 = no). We also employed a variable indicating whether a recent life change had made the respondent's financial situation worse or much worse (0 = no; 1 = yes). Finally, an indicator of unmet needs was created using a series of questions asking about changes that impacted the respondent's life (personal, family, or work-related) experienced in the 12 months preceding the survey. Respondents also were asked whether help or resources were needed, and received or available, to cope with the most impactful change. Unmet needs was coded as one if the respondent reported that they had experienced impactful changes with which they needed help and that the help needed was unavailable; otherwise it was coded as zero.

#### *Social Network Characteristics*

We used two indicators of kin relationships: (a) number of close relatives in the respondent's network; and (b) whether the respondent had any face-to-face and/or telephone contact with relatives in the past week. Friend relationships were similarly measured as (a) number of close friends in the respondent's network; and (b) whether the respondent had any face-to-face and/or telephone contact with friends in the past week. Religious participation was measured as a dichotomous variable indicating whether the respondent attended church at least a few times each year (0 = no; 1 = yes), while community participation was a continuous variable measured as the number of community organizations in which respondents were actively involved.

#### *Evaluations of Network Quality*

While respondents were not asked explicitly to evaluate the quality of their social networks or contacts,

they were asked how satisfied they were with the frequency with which they were in contact with members of their network of relatives and friends. These two variables were used as dichotomous variables in the multivariate analyses, indicating whether the respondent was satisfied or very satisfied (0 = yes; 1 = no). Finally, we used the answers to the question about how satisfied the respondent was with life currently as a proxy indicator of the respondent's sense of fit between environmental demands and personal resources. This variable had 10 response categories, ranging from very dissatisfied to very satisfied. We entered the variable in the multivariate analyses as a dichotomous variable: 0 = scores 7 to 10 (satisfied), and 1 = scores 1 to 6 (not satisfied).

#### *Analyses*

We estimated weighted frequencies for categorical variables, and means and standard deviations for continuous variables, and these are reported in Table 1. We used hierarchical regression models to examine the unique contribution to variation in loneliness scores of each of the four sets of explanatory variables. Blocks of variables were entered into the models in the following order: (1) personal characteristics; (2) quality of living conditions; (3) social network characteristics; and (4) evaluation of network quality.

## **Results**

### *Sample Description*

Descriptive statistics for the dependent and independent variables can be found in Table 1. Loneliness scores range from 0 (not lonely) to 6 (extremely lonely) with a mean score for the sample of 1.27 ( $SD = 1.32$ ). For the sample used for the current study, Cronbach's alpha across the 6 items was .64.

The sample was fairly evenly split between men and women (44.8% and 55.2% respectively). About one-third (32%) were aged 65–69, another one-quarter (24.4%) were aged 70–74, 19.6% were aged 75–79, and almost one-quarter (23.9%) were age 80 or older. Almost three-quarters (74.8%) of our respondents reported their health as good, very good, or excellent, and 93.3% reported their mental health as good, very good, or excellent. The majority of respondents were either married (65%) or widowed (24%) while small proportions were separated/divorced or never been married (7.3% and 3.7% respectively).

Almost two-thirds of respondents had completed at least high school, but more than one-third (36%) had no high school diploma or equivalent. Slightly more than one-fifth (20.8%) of respondents lived in rental housing rather than owning their own home. Only 8.8 per cent

**Table 1: Sample description of the General Social Survey, Cycle 22, Social Networks – Respondents aged 65 or older**

Variables	Mean or %	SD
Loneliness	1.27	1.32
<i>Personal characteristics</i>		
Sex: % female	55.2	
<i>Age</i>		
65–69	32.0	
70–74	24.4	
75–79	19.6	
80 and older	23.9	
Subj. health: % fair, poor	25.2	
Mental health: % fair, poor	6.7	
<i>Marital status</i>		
Married or common law	65.0	
Widowed	24.0	
Divorced, separated	7.3	
Never married	3.7	
<i>Deprived living conditions</i>		
Educational level: % less than high school certificate	36.0	
Own house? % no	20.8	
Change last year affected financial situation? % after change finances are (much) worse	8.8	
Changes last year and help available? % after change with unmet needs	5.3	
<i>Social networks/Social engagement</i>		
Seeing/phoning any of the relatives at least weekly? % no	21.2	
Number of close relatives	7.6	11.4
Seeing/phoning any friend at least weekly? % no	26.9	
Number of close friends	6.9	13.0
Religious attendance at least few times per year? % no	38.4	
Member of organisations?	1.2	1.38
<i>Evaluations/Satisfaction</i>		
Satisfied with frequency of communication with relatives: % not (very) satisfied	6.8	
Satisfied with frequency of communication with friends: % not very satisfied	9.0	
Satisfied with life right now: % not very satisfied	14.2	

of our sample reported that their financial situation had worsened as the result of a recent life event, and an even smaller proportion (5.3%) reported having any related unmet needs.

Respondents had fairly sizable social networks comprising an average of 7.6 ( $SD = 11.4$ ) close relatives and 6.9 ( $SD = 13.0$ ) close friends, but 21.2 per cent and 26.9 per cent reported that they had had no in-person or voice contact with any of their family members or friends during the past week, respectively. More than one-third (38.4%) of respondents were not regular churchgoers, and they reported belonging to an average of 1.2 ( $SD = 1.38$ ) community organizations.

Despite the sizable minority of respondents who reported no contact with their family members and friends in the past week, they seemed, on average, to be content with the amount of contact they had. Only 6.8 per cent and 9 per cent said they were dissatisfied or very dissatisfied with the frequency with which they had face-to-face or telephone contact with their family members and friends respectively.

They were, by and large, quite happy with life overall at the time of the survey: only 14.2 per cent said they were dissatisfied or very dissatisfied.

#### *Determinants of Loneliness*

Here, we present the unstandardized and standardized coefficients,  $B$  and  $\beta$ , for the hierarchical regression analysis on loneliness (see Table 2) and discuss support for our hypotheses within the context of the existing literature. Each of the four blocks of variables – personal characteristics, deprived living conditions, social networks/social engagement, and satisfaction – contributed significantly to the variance in loneliness, as indicated in Table 2.

Findings for Model 1 in Table 2 illustrate the relationship between personal characteristics and loneliness. All of the personal characteristic variables were significantly related to loneliness with the exception of age. Those in poor physical and poor mental health were lonelier than those in excellent or good health. Those who were widowed, divorced or separated, or never

**Table 2: Outcomes of hierarchical regression analysis on loneliness; Canadian men and women aged 65 and older**

Variables	Model 1		Model 2		Model 3		Model 4	
	B	$\beta$	B	$\beta$	B	$\beta$	B	$\beta$
<i>Personal characteristics</i>								
Sex (M, F)	-.10	-.04*	-.12	-.05**	-.09	-.03*	-.10	-.04*
Age	.02	.02	.02	.02	.02	.02	.03	.03
Subjective health: excellent/good vs. fair/poor	.45	.15***	.37	.12***	.32	.10***	.19	.06***
Mental health: excellent/good vs. fair/poor	.80	.16***	.72	.14***	.69	.14***	.43	.08***
Married or common law (reference category)								
Widowed	.20	.07***	.17	.08**	.18	.06**	.15	.05**
Divorced, separated	.30	.07***	.26	.06***	.22	.05**	.15	.03*
Never married	.19	.03*	.16	.03	.15	.03	.10	.01
<i>Deprived living conditions</i>								
Less than high school certificate? No vs. yes			.15	.05**	.09	.03*	.10	.04*
Own house? Yes vs. no			.11	.04*	.09	.03	.07	.02
Change last year affected financial situation? No change/finances better/equal vs. much worse			.25	.06**	.26	.06***	.17	.04*
Changes last year and help available? No change/help available vs. unmet needs			.71	.12***	.70	.12***	.58	.10***
<i>Social networks/Social engagement</i>								
Seeing/phoning any relatives at least weekly? Yes vs. no					.13	.04*	.04	.01
Number of close relatives: 0 →					-.01	-.10***	-.01	-.09***
Seeing/phoning any friend at least weekly? Yes vs. no					.22	.07***	.16	.05**
Number of close friends: 0 →					-.00	-.03*	-.00	-.02
Religious attendance at least a few times per year? Yes vs. no					.05	.02	.00	.00
Member of organisations? 0 →					-.05	-.05**	-.04	-.04**
<i>Evaluations/Satisfaction</i>								
Satisfied with frequency of communication with relatives: (very) satisfied → (very) dissatisfied							.78	.15***
Satisfied with frequency of communication with friends: (very) satisfied → (very) dissatisfied							.24	.05**
Satisfied with life right now: (very) satisfied → (very) dissatisfied							.79	.21***
<i>R sq adj</i>	.070		.093		.120		.188	

**Source: GGS, Cycle 22**

married were significantly lonelier than those who were married, and men were significantly lonelier than women. The variables included in Model 1 explained 7 per cent of the variance in loneliness.

Model 2 illustrates the relationship between deprived living conditions and loneliness. Having less than a high school education, not owning a house, having experienced a negative change in finances, and having unmet needs were significantly related to loneliness. Adding characteristics of deprived living conditions to the model reduced the effect on loneliness of being never married, suggesting that differences in living conditions account for part of the association between being never married and loneliness. Variables included in Model 2 explained 9 per cent of the variance in loneliness.

In Model 3, social network/social engagement resources were added to the variables representing personal characteristics and deprived living conditions. All of the variables in this block were significant with the exception of

religious attendance. Having a small number of close relatives and a small number of close friends both were significantly and positively related to loneliness. Respondents reporting less than weekly contact with relatives and less than weekly contact with friends were significantly more lonely. Belonging to fewer organizations was significantly and positively related to level of loneliness, but religious attendance was not. Once variables representing social network characteristics were added to the model, one dimension of deprived living conditions, owning one's own home, became non-significant. Variables included in Model 3 explained 12 per cent of the variance in the loneliness.

Model 4 represents the full model with the addition of satisfaction variables. All of the satisfaction variables were significantly associated with loneliness. The only variables that dropped out of this final model were from the social networks/social engagement block of variables. Neither weekly contact with relatives nor number of close friends remained significant,

suggesting that the influence of these variables on loneliness was at least partly explained by differences in satisfaction with these facets of the social network. The final model explained 19 per cent of the variances in loneliness.

With respect to our hypotheses, we found that patterns of significance across the four models provided information on the strength of support for our hypotheses and for our proposed conceptual framework.

The entry of personal characteristics as the first block of variables allowed us to track their explanatory value across models as blocks of variables related to other resources and to satisfaction were entered. Support for hypothesis 1 was mixed. Marital status was important although being never married was not significant in the final model, suggesting that change in marital status is a more important correlate of loneliness than is being without a partner. Gender was significant, but in the opposite direction to what was hypothesized. Being male was significantly related to loneliness across all models, suggesting a vulnerability that is not explained by access to personal, social, or contextual resources. Notably, age was not significantly associated with loneliness when other personal characteristics were taken into account. As predicted, both physical and mental health were negatively associated with loneliness (hypothesis 2).

Deprived living conditions also were significant in the final model with the exception of home ownership, providing partial support to hypothesis 3. Lower levels of education may be a proxy for lack of access to resources that provide for a comfortable living situation. In turn, losses related to financial adequacy and unmet needs indicate that *transitions* in living conditions are important precursors of loneliness.

Despite the fact that social networks and social engagement have comprised the core concepts in understanding loneliness in prior research, only 3 of the 6 variables in this block were significant in the final model. Hypothesized relationships between loneliness and number of close relatives and contact with relatives (hypothesis 4) operated differently than relationships with friends (hypothesis 5). In the final model, having fewer close relatives (but not recent contact with relatives) was significantly related to loneliness. In contrast, recent contact with friends (but not having fewer close friends) was significant. Perhaps because kin contact is more obligatory, loneliness is reduced only if frequency of contact is deemed satisfying, while having close kin may provide a sense that support is available if needed (Holt-Lunstad, Smith, & Layton, 2010). In contrast, friendships are discretionary and hence choosing to have contact with friends is evidence of the strength of the relationship.

Hypothesis 6, that organizational involvement is negatively related to loneliness, also received only partial support. Organizational membership was significantly associated with loneliness, but church attendance was not significant across any of the models.

Finally, all of the satisfaction variables were negatively associated with loneliness. Support for hypothesis 7 (that satisfaction with communication with relatives and friends is negatively associated with loneliness) was congruent with the longstanding assumption in the loneliness literature that loneliness is an outcome of the use of "relationship standards" (Perlman & Peplau, 1981) to evaluate kin and non-kin relationships. Additional findings that life satisfaction was negatively associated with loneliness (hypothesis 8) supported Edwards et al.'s (2006) contention that it is necessary to explore the broader context of person-resources fit in order to better understand quality of life of older persons. The separate contribution of life satisfaction to loneliness was an indication that resources and constraints in addition to those afforded by social network engagement were important precursors to loneliness.

## Discussion

Results from this study provide insight into the contributions of personal and social resources and living conditions, and also afford insight into the evaluation of these resources to our understanding of loneliness. We highlight themes from our findings, commenting on the relative advantages and limitations of the expanded ecological model of loneliness used here.

For the most part, examining personal characteristics as an explicit element of the loneliness model confirmed previous findings about the importance of resources afforded by good health and marriage in protecting against loneliness. But this approach also highlighted two possible anomalies that warrant further investigation. The first is that age was not significant in any of the models. This finding seems at odds with previous research showing that people are more likely to have smaller social networks in advanced age (Carstensen, 1995) and to be less engaged in the community (Fast & De Jong Gierveld, 2008). However, other researchers have challenged the assumption that age is the main reason for such losses. For example, Van Tilburg and Broese van Groenou (2002) found that chronic health problems or disabilities were more important than age in determining engagement in networks of kin and non-kin, and in voluntary activities. We add to this body of literature by showing that once such personal and social engagement characteristics are accounted for, age is not associated with loneliness. Challenging assumptions of age as the main driver of quality of later life continues to be important.



Gender also was significantly associated with loneliness, but men rather than women were lonelier, a finding that contradicts much of the previous research (Aartsen & Jylhä, 2011; Steptoe, Shankar, Demakakos, & Wardle, 2013), although it is in line with research by Hawkey et al. (2008). This raises a question as to whether social gerontologists have taken for granted assumptions that aging is gendered but have not engaged sufficiently with debates about *how men's experiences* differ from those of women. The so-called "double jeopardy" of being old and female has resulted in much research on how women's aging is more problematic than men's (Krekula, 2007) but not enough about factors that influence gendered identities in later life, nor about dimensions of aging that are difficult for men (McMullin & Cairney, 2004).

Findings of significant relationships between transitions and loneliness point to the importance of recent empirical advancements in longitudinal and panel research that allow for examination of more-dynamic loneliness frameworks. Our findings suggest that some transitions may be more important in understanding loneliness than has been previously discussed. The relevant aspect of our findings related to deprived living conditions was that *changes* towards worse financial situations and unmet needs were associated with loneliness.

Overall findings that social resources of kin and friends are negatively related to loneliness supports core assumptions that these relationships are important in later life. Kin and friend networks operate differently in relation to loneliness. Family contact did not add to the explanatory value of the model, a reminder of the ambivalent aspects of family relationships (Giarrusso, Silverstein, Gans, & Bengtson, 2005; Lüscher & Pillemer, 1998). Findings that marriage protects against loneliness, but that frequency of contact with other kin does not, suggest that there is still much to learn about the nuances of family interaction and ambivalence in later life (Choudhry, 2001; Connidis & McMullin, 2002; De Jong Gierveld et al., 2009).

In the introduction to this article, we posed a question about whether loneliness among older Canadians is distinct from loneliness among older adults in other parts of the world. A striking feature of our findings is the relatively low scores on loneliness. When compared to findings from the Generations and Gender Surveys of seven different countries (France, Germany, Netherlands, Russia, Bulgaria, Georgia, Japan) also using the De Jong Gierveld Loneliness Scale (De Jong Gierveld & Van Tilburg, 2010), Canada scored lowest of all of the countries. In comparing Canadian older adults to their Czech peers, Rokach (2007) observed that older adults in Canada were less likely to attribute

loneliness to personal inadequacies. It may be that the cultural history of Canada, a nation of immigrants with traditions of self-reliance and independence that may be intensified by vast distances and isolation, contributes to a sense of connectedness despite the objective appearance of hardships (Keating, Swindle, & Fletcher, 2011).

The conceptual framework for this study built on earlier frameworks of loneliness by adding two sets of resources – personal characteristics and deprived living conditions – to resources afforded by social networks. Life satisfaction was added to satisfaction with social networks to capture broader evaluations of person-context fit. Each of these sets of resources and evaluations contributed to the final loneliness model.

There is a growing body of literature on the importance of transitions in personal resources in understanding loneliness. While there is considerable research showing the importance of loss of a marital relationship through widowhood or divorce (Aartsen & Jylhä, 2011; Dykstra, Van Tilburg, & De Jong Gierveld, 2005; Victor & Bowling, 2012), other transitions in marital roles, such as chronic illness of a spouse or placement of a spouse in residential care, warrant consideration. Conceptual work of Boss (2004) on ambiguous loss might inform this issue. For example, does the loss of a spousal relationship resulting from dementia contribute to loneliness in ways similar to other pathways to relationship loss?

Shortcomings in the data file preclude further examination of relationship issues that may influence loneliness. There is no structural information about children (e.g., numbers, ages, geographical distance, or frequency of contact), nor about supportive exchanges between parents and children. Nor is information about quality of relationships with children, spouse, and siblings available. These data gaps limit our understanding of what contributes to relationship satisfaction and ultimately to loneliness.

Transitions related to living conditions in addition to those found in this study also may be important. A number of examples of such changes have not been considered in relation to loneliness. For example, moves into supportive housing may result in disruption of existing social relationships (Adams, Sanders, & Auth, 2004) and thus increase the likelihood of loneliness. Other transitions in living situations may result from neighbourhood, rather than individual, changes. In research on older adults living in inner cities, Smith, Sim, Scharf, and Phillipson (2004) found that older people who were longstanding residents of their communities became disconnected from their neighbourhoods as a result of a shifting ethnic mix. Keating et al. (2013)

found that longstanding residents of a newly affluent retirement community were no longer able to afford to attend social activities that previously provided venues to bring them into contact with friends.

In sum, a relatively small proportion of older Canadians report high levels of loneliness. Further research on this group who retain their satisfaction with connection to others as they navigate late-life transitions may help inform our understanding of how older adults re-calibrate the fit between their changing personal resources and environmental contexts.

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